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RESEARCH ARTICLE

Rethinking Psychomotor Assessment in Hospitality and Tourism: Miller's Pyramid Perspective

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ABSTRACT

This conceptual paper aims to explore the applicability of Miller's Pyramid as a framework for designing psychomotor assessments in the field of hospitality and tourism education. While Miller's Pyramid was originally developed for healthcare education, its structured approach to assessing psychomotor skills development has the potential to benefit other education fields, including hospitality and tourism. The paper begins by discussing the evolution and growth of hospitality and tourism programs, emphasizing the increasing demand for practical skills in these fields. It then delves into the psychomotor learning domain in hospitality and tourism education, drawing parallels to Simpson's Psychomotor Domain. The paper concludes by proposing how Miller's Pyramid can be adapted to design effective psychomotor assessments tailored to hospitality and tourism programs.

Contribution/Originality: This study documents a novel application of Miller's Pyramid to the realm of hospitality and tourism education. It offers a pioneering conceptual framework for psychomotor skill assessment, addressing a crucial gap in the field. By bridging theory and practice, this research paves the way for enhanced skill development among students in this dynamic industry.

1. Pengenalan

Psychomotor skills, characterized by the ability to perform physical tasks or actions with precision and expertise, represent a foundational element of education and professional training across a multitude of disciplines (Ludke et.al, 2023; Mustaffa & Joseph, 2020; Plummer et. al, 2021; Viscione et. al, 2017; Wening & Siti Munadhiroh, 2020). These skills encompass a broad spectrum, ranging from clinical procedures in healthcare to culinary techniques in the hospitality and tourism industry. Assessing and nurturing psychomotor

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skills is integral to the educational process, ensuring that learners not only acquire theoretical knowledge but also develop the practical competence required for their chosen careers (Amin et. al, 2021; Tapsir et. al, 2017). However, a persistent challenge in education and professional training has been the disproportionate emphasis on theoretical knowledge in traditional assessment methods (Asante, 2023; Hill et. al, 2018). These conventional approaches have often side-lined the critical dimension of practical application. Consequently, students may graduate with a sound theoretical understanding of their field but lack the hands-on expertise necessary to excel in real-world situations. This discrepancy between knowledge acquisition and its practical utilization underscores the need for a more comprehensive and effective approach to psychomotor skill assessment (Asante, 2023; Hill et. al, 2018).

This paper addresses this critical issue by embarking on a thorough exploration of George E. Miller's Pyramid, a purpose-built framework tailored to rectify the shortcomings of conventional assessment practices (Miller, 1990). While this problem is not unique to a specific discipline, it is particularly relevant to the hospitality and tourism industry, where graduates are expected to seamlessly blend theoretical knowledge with practical competence to meet the industry's dynamic demands. Therefore, this paper explores the possibilities of using Miller's Pyramid, a framework initially designed for healthcare education, to design effective psychomotor assessments in hospitality and tourism programs. By investigating the application of Miller's Pyramid, this research aims to bridge the existing gap between theoretical learning and practical proficiency in the context of hospitality and tourism education. It seeks to ascertain whether Miller's Pyramid offers a viable solution to the challenges posed by traditional assessment methods, ultimately contributing to the enhanced readiness of graduates for successful careers in this ever-evolving industry. This exploration aligns with the broader goals of education reform and the demand for graduates who can effectively apply their knowledge in real-world scenarios, making it a pertinent problem in contemporary education and professional training.

1.1. Research Objectives

This paper endeavours to achieve several key objectives by exploring the application of George E. Miller's Pyramid in the assessment of psychomotor skills within hospitality and tourism education. The primary research objectives are:

i. To explore the applicability of Miller's Pyramid in the context of hospitality and tourism education.
ii. To compare the benefits and limitations of using Miller's Pyramid with the current practices of psychomotor assessment in hospitality and tourism education.

2. Literature Review

2.1. The Psychomotor Learning Domain in Hospitality and Tourism Education

The field of hospitality and tourism education has evolved significantly, offering programs at various levels, including undergraduate and graduate levels. This expansion is driven by the rapid growth and demand in the tourism sector. Hospitality and tourism education traditionally focused on developing practical knowledge and skills. Consequently, many programs now fall under the umbrella of hospitality and tourism management, blending technical expertise with business acumen (Malaysia Qualification Agency, 2019;

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Ottenbacher et al., 2009). The curriculum encompasses subfields such as travel and tourism, hospitality, culinary arts, and foodservice.

Psychomotor skills play a vital role in the hospitality and tourism industry, where precision, coordination, and smooth bodily movements are essential. In these programs, practical components typically constitute a significant portion of the curriculum, accounting for 60 to 70 percent, as outlined in the Programme Standards of Hospitality and Tourism (Malaysian Qualification Agency, 2019). In the context of hospitality and tourism education, the psychomotor learning domain draws inspiration from Simpson's (1972) Psychomotor Domain, which comprises seven levels of skill development. These levels align with the diverse range of psychomotor skills required in the industry, particularly in courses such as Food and Beverage Service and Food Production. These various practical courses are intricately connected to distinct psychomotor skill levels. This linkage is established through the formulation of Course Learning Outcomes (CLOs).

CLOs represent concise statements delineating essential and measurable learning objectives that students are expected to attain and exhibit by the conclusion of a course. To facilitate effective assessment of student performance and learning outcomes, CLOs are meticulously designed to align with the varying levels of Bloom's Taxonomy for each course undertaken in each semester. This meticulous alignment ensures that the psychomotor skills cultivated during the course are appropriately assessed and serve as a foundational aspect of the educational experience. Table 1 illustrates an example of how learning outcomes for each of from Simpson's (1972) Psychomotor Domain levels can be tailored to a Food and Beverage Service Course:

Table 1: Example of learning outcome for Food and Beverage Service course

Simpson's Psychomotor Domain Level	Examples of Learning Outcomes
P1 (Perception)	Determine the proper dinnerware and its purposes.
P2 (Set)	Show good personal grooming and hygiene practices in the restaurant.
P3 (Guided Response)	Reproduce the appropriate table setting for various menu types.
P4 (Mechanisms)	Display the proper steps for serving guests using the traditional fine dining service sequence.
P5 (Complex Overt Response)	Display a service sequence for various table service styles accurately.
P6 (Adaptation)	Modify the service sequence for disabled guests in a restaurant.
P7 (Origination)	Develop a service sequence that fits Malay eating customs.

This table summarizes the learning outcomes at each level of from Simpson's (1972) Psychomotor Domain for a Food and Beverage Service Course in hospitality and tourism education. These learning outcomes exemplify how each level of the psychomotor domain can be translated into practical objectives for a Food and Beverage Service Course. By aligning these outcomes with the curriculum and assessments, educators can effectively nurture students' psychomotor skills and prepare them for success in the dynamic and demanding hospitality and tourism industry.

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2.2. The Miller's Pyramid

Miller's Pyramid provides a structured framework for assessing and developing psychomotor skills across various disciplines. This model defines four hierarchical levels of competency: "Knows," "Knows How," "Shows How," and "Does." Each level represents a different facet of skill development, with "Knows" emphasizing knowledge acquisition, "Knows How" focusing on practical application, "Shows How" requiring demonstration under supervision, and "Does" signifying proficiency in real-world scenarios.

2.1.1. "Knows" Level of Competency

The "Knows" level of competency centers on acquiring factual knowledge and understanding essential concepts. Researchers such as Miller (1990) emphasized that this foundational level serves as the basis for higher-level competencies. Assessment methods at this level primarily involve objective tests, including MCQs, short essays and quizzes (Hasani et al., 2021; Rhind et al., 2020). Peer assessment and self-assessment have also been integrated into evaluations (Roussin et al., 2019).

2.1.2. "Knows How" Level of Competency

Building on the "Knows" level, "Knows How" requires learners to apply their knowledge practically. Thampy et al. (2019) argued that this level is essential for problem-solving and critical thinking skills. Assessment methods include MCQs, role play, simulated encounters, and other evaluations such as PMPs and computer-based simulations (Cruess et al., 2016; Hoepner & Hemmerich, 2020; Thampy et al., 2019).

2.1.3. "Shows How" Level of Competency

The "Shows How" level focuses on performance and the ability to demonstrate skills under supervision. Researchers like Cruess et al. (2016) stressed that this level bridges the gap between theoretical knowledge and practical application. OSCE and similar evaluation methods, involving multiple clinical stations and standardized individuals, are commonly used (May & Head, 2010; Roussin et al., 2019). Simulation platforms and computer algorithms are also employed for assessment (Roussin et al., 2019).

2.1.4. "Does" Level of Competency

At the highest level of Miller's Pyramid, the "Does" level requires students to apply their skills in real-world settings. Researchers emphasize the importance of this level to ensure learners are prepared for professional practice. Assessment methods include clinical assessment, performance-based assessment, in-service training and workplace-based assessments (Isola, 2020; Rhind et al., 2020; Thampy et al., 2019).

2.1.5. Synthesis of Findings

The review of literature reveals a consistent pattern of progression in the development and assessment of psychomotor skills, as outlined by Miller's Pyramid. At the "Knows" level, researchers highlight the significance of acquiring fundamental knowledge and terminologies, often assessed through objective tests. "Knows How" builds upon this knowledge, requiring learners to apply it practically, fostering problem-solving abilities. The "Shows How" level emphasizes performance and the ability to demonstrate skills

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under supervision, often evaluated through OSCE and simulations. Lastly, the "Does" level signifies the highest competency, necessitating real-world application and evaluation in professional settings.

Synthesizing these findings, it becomes evident that Miller's Pyramid offers a structured approach to skill development and assessment, applicable across various disciplines. The model emphasizes the importance of progressive development, ensuring that learners not only possess theoretical knowledge but can also apply it effectively in practical scenarios. This comprehensive approach to skill development is essential for producing competent professionals capable of meeting the demands of their respective fields. However, it is crucial to recognize that competence at one level does not guarantee proficiency at higher levels, emphasizing the need for thorough evaluation and training at each stage of the pyramid. Based on the synthesized findings from the literature review, here is an arrangement of Miller's Pyramid levels along with the suggested assessment methods:

Table 2 outlines the various assessment methods associated with each level of Miller's Pyramid, providing a clear overview of how learners can progress from acquiring knowledge to applying and demonstrating skills in real-world scenarios.

Table 2: Alignment of Miller's Pyramid levels into suggested assessment methods

Pyramid Level	Description	Suggested Assessment Methods
"Knows" Level	Factual knowledge and understanding of essential concepts	- Multiple-choice questions (MCQs) - Short written answer questions (SA) - Essay - Quizzes - Discussions - Daily assignments - Peer assessment - Self-assessment
"Knows How" Level	Application of knowledge practically	- MCQs - Role play - Simulated encounters - Patient management problems (PMP) - Computer-based simulations - Script concordance test (SCT) - Key feature questions (KFQ) - Clinical integrative puzzle (CIP) - ASCLIRE method (computer-delivered scenarios)
"Shows How" Level	Demonstration of skills under supervision	- Objective Structured Clinical Examination (OSCE) - Simulated scenarios using standardized patients - SImZones software - Peer and self-assessment using simulation - Presentation - Data analysis, visualization, interpretation - Case study analysis - Capstone paper
"Does" Level	Application in real-world professional settings	- Clinical rotation - Criterion-based testing - In-service observation - Workplace-based assessments

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	- Practicum - Group projects - Role-based simulations - Capstone projects - Logbook

2.3. Adapting Psychomotor Assessments Based on Miller's Pyramid

As aforementioned, Miller's Pyramid, originally designed for healthcare education, provides a structured approach to assessing psychomotor skills development. While healthcare and hospitality and tourism differ in their specific skill requirements, the underlying principles of Miller's Pyramid can be adapted to suit the latter. The pyramid's four levels of competency, "Knows," "Knows How," "Shows How," and "Does," can be reinterpreted to align with the practical aspects of hospitality and tourism education. Table 3 illustrates recommendations on how the assessment methods derived from the findings can be adopted in a hospitality and tourism program.

Table 3: Possible assessment methods for psychomotor skills in hospitality and tourism education based on each level of Miller's Pyramid.

Level of Competency	Recommendations for Adoption in Hospitality and Tourism Programs
"Knows"	Utilize Multiple-Choice Questions (MCQs) and quizzes to assess foundational knowledge in topics such as customer service principles, tourism regulations, and industry terminology. Incorporate essays and written critiques to encourage students to explore and articulate key concepts in the field. Promote peer and self-assessment to foster a deeper understanding of theoretical knowledge.
"Knows How"	Integrate role play and simulated encounters that mimic real-world scenarios, allowing students to apply their knowledge in practical situations. For instance, simulate hotel reservation processes or travel planning scenarios. Use patient computer-based simulations to engage learners in critical thinking and problem-solving relevant to hospitality and tourism contexts. Encourage data analysis and case study analysis to assess the ability to apply knowledge in marketing campaigns, event management, and tourism destination planning.
"Shows How"	Implement Objective Structured Clinical Examination (OSCE) techniques adapted to the hospitality and tourism context. Develop simulated hotel or resort scenarios for students to demonstrate their skills in front-office operations, event coordination, or guest service. Utilize simulation platforms to provide diverse viewpoints and allow for peer and self-assessment, enhancing the evaluation of practical skills. Consider computer algorithms for performance assessment in areas such as reservation systems management or hospitality software usage.
"Does"	Facilitate internships in real hospitality and tourism settings, where students can put their acquired skills into practice. Ensure that these internships are structured and provide opportunities for students to perform tasks associated with their chosen career paths.

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	Use workplace-based assessments to evaluate students' performance during internships, focusing on competencies such as event management, guest interactions, and operational responsibilities. Assign practical projects, such as group projects, role-based simulations, and capstone projects, that require students to apply their skills in solving real industry challenges. Encourage the use of logbooks to reflect on their experiences during internships, fostering a deeper understanding of their practical skills and professional growth.

These recommendations align assessment methods with specific levels of competency in Miller's Pyramid and offer strategies for their adoption within a hospitality and tourism program. By implementing these assessment techniques, educators can ensure that students not only acquire theoretical knowledge but also develop the practical competencies necessary for success in the dynamic and customer-focused hospitality and tourism industry. In summary, Miller's Pyramid offers a robust and effective framework for assessing psychomotor skills in hospitality and tourism programs. It promotes structured skill development, comprehensive evaluation, and real-world relevance, all of which are essential for preparing students for successful careers in the dynamic and customer-centric hospitality and tourism industry.

3. Conclusion and Recommendations for Future Research

In conclusion, this conceptual paper has unveiled the potential of Miller's Pyramid as a valuable framework for designing psychomotor assessments in hospitality and tourism education. It emphasizes the importance of bridging the gap between theoretical knowledge and practical skills to prepare students for success in this dynamic industry. By adapting Miller's Pyramid to the unique needs of hospitality and tourism programs, educators can guide students through a progressive journey, from knowledge acquisition to skill mastery. The integration of psychomotor assessments into the curriculum ensures that graduates are not only well-informed about industry-specific concepts but also possess the essential practical skills required for their roles. As hospitality and tourism education continues to evolve, leveraging Miller's Pyramid offers a structured and effective approach to enhancing skill development and competency among students.

Moving forward, future research should focus on empirically validating the proposed framework based on Miller's Pyramid in the context of hospitality and tourism education. Comparative analyses should be conducted to evaluate the effectiveness of Miller's Pyramid against other existing models in various educational fields. Furthermore, exploring the applicability of Miller's Pyramid in other domains and investigating the role of technology in enhancing psychomotor skill assessments within this framework are avenues worth pursuing. Innovative pedagogical strategies aligned with the pyramid's levels should also be examined. These recommendations highlight the need for further exploration and validation of this framework, with the potential to revolutionize skill assessment methodologies across various educational disciplines. In embracing this framework, educators and institutions can better prepare students to excel in the demanding and competitive landscape of the hospitality and tourism industry.

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Conflict of Interest

The authors declare no conflicts of interest in relation to the research, authorship, or publication of this paper.

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